

CLAIMS

What Is Claimed Is:

1. An endodontic post comprising:
 - a post section, the post section comprising a rigid endodontic section and a tip section;
 - wherein the tip section is a flexible carrier surrounded by a filler cone; and
 - wherein the tip section comprises one or more protrusions extending outwardly from the tip section for engaging the filler cone.

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2. The endodontic post of claim 1 wherein the flexible carrier is integral to the post section.

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3. The endodontic post of claim 1 wherein the post section comprises an apical portion and an endodontic portion and wherein the apical portion comprises the flexible carrier.

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4. The endodontic post of claim 1 wherein the flexible carrier extends approximately the full length of the filler cone.

5. The endodontic post of claim 1 wherein the flexible carrier extends a portion of the length of the filler cone.

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6. The endodontic post of claim 1 wherein the one or more protrusions extending outwardly from the tip section comprise a single protrusion disposed annularly at a point around the tip section.

7. The endodontic post of claim 1 wherein the one or more protrusions extending outwardly from the tip section comprise a series of protrusions disposed at various points

along the length of the tip section.

8. The endodontic post of claim 1 wherein the one or more protrusions are selected from the shape consisting of spherical, cylindrical, rectangular, ovoid, and semi-spherical.

9. The endodontic post of claim 3 wherein the apical portion of the post is narrower in diameter than the diameter of the endodontic portion.

10. The endodontic post of claim 3 wherein the post further comprises a supracoronal portion.

11. The endodontic post of claim 1 wherein the post section is fabricated of metal, plastic, composite, ceramic, glass or polymeric material.

12. The endodontic post of claim 11 wherein the polymeric material is selected from the group consisting of thermoplastic, thermoset, chemoplastic resins and mixtures thereof.

20 13. The endodontic post of claim 11 wherein the composite material comprises fiber reinforced composite material.

14. The endodontic post of claim 11 wherein the composite material comprises filler reinforced composite material.

25 15. The endodontic post of claim 1 wherein the filler cone comprises a thermoplastic or chemoplastic material.

16. The endodontic post of claim 1 wherein the filler cone comprises a resinous

material.

17. The endodontic post of claim 1 wherein the filler cone comprises gutta percha.

5 18. The endodontic post of claim 1 wherein the filler cone comprises polyacrylate, polyurethane, polypropylene, polyethylene, polyamide, fluoropolymer, polyester, polyphosphazene, polyanhydride, polysulfide, polyether, epoxy, polycarbonate, polystyrene, polybutadiene, polyphenylene oxide, silicone rubber or a mixture thereof.

10 19. The endodontic post of claim 18 wherein the polyacrylate comprises polymethyl methacrylate, polyhydroxy ethyl methacrylate, or hydroxy ethyl methacrylate (HEMA).

20. The endodontic post of claim 18 wherein the fluoropolymer comprises
15 Teflon® PTFE or Teflon® PFA.

21. The endodontic post of claim 18 wherein the polyester comprises polylactic acid, glycolide, polycaprolactone or a co-polymer thereof.

20 22. The endodontic post of claim 18 wherein the silicone rubber comprises polysiloxane.

23. The endodontic post of claim 1 wherein the filler cone comprises polylactides, polyglycolides, polycaprolactones, polyanhydrides, polyamides, polyurethanes, polyesteramides, polyorthoesters, polydioxanones, polyacetals, polyketals, polycarbonates, polyorthocarbonates, polyphosphazenes, polyhydroxybutyrate, polyhydroxyvalerates, polyalkylene oxalates, polyethylene oxides, polyacrylates/methacrylates, polyalkylene succinates, poly(malic acid) polymers, polymaleic anhydrides, poly(methylvinyl) ethers, poly(amino acids), chitin, chitosan, and copolymers, terpolymers, or combinations or

mixtures thereof.

24. The endodontic post of claim 16 wherein the filler cone further comprises a plasticizing agent, antibiotic agent, cariostatic agent, antibacterial agent, anti-inflammatory agent, biologically active agent, or therapeutic agent, or mixtures thereof.

25. A device for filling a root canal comprising:
a carrier; and
a filler cone;
10 wherein the filler cone is disposed on the carrier;
wherein the carrier comprises a rigid handle section and a tip section;
wherein the tip section is a flexible section surrounded by the filler cone; and
wherein the tip section comprises one or more protrusions extending outwardly
from the tip section for engaging the filler cone.

15 26. The device for filling a root canal of claim 25 wherein the flexible tip section is integral to the carrier.

27. The device for filling a root canal of claim 25 wherein the flexible section
20 extends approximately the full length of the filler cone.

28. The device for filling a root canal of claim 25 wherein the flexible section
extends a portion of the length of the filler cone.

25 29. The device for filling a root canal of claim 25 wherein the one or more
protrusions extending outwardly from the tip section comprise a single protrusion extending
annularly at a point around the tip section.

30. The device for filling a root canal of claim 25 wherein the one or more

protrusions extending outwardly from the tip section comprise a series of protrusions disposed at various points along the length of the tip section.

31. The device for filling a root canal of claim 25 wherein the one or more
5 protrusions are selected from the shape consisting of spherical, cylindrical, rectangular,
ovoid, and semi-spherical.

32. The device for filling a root canal of claim 25 flexible tip section is
narrower in diameter than the handle section.

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33. The device for filling a root canal of claim 25 wherein the carrier is fabricated
of metal, plastic, composite, ceramic, glass or polymeric material.

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34. The device for filling a root canal of claim 33 wherein the polymeric material
is selected from the group consisting of thermoplastic, thermoset, chemoplastic resins and
mixtures thereof.

35. The device for filling a root canal of claim 33 wherein the composite material
comprises fiber reinforced composite material.

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36. The device for filling a root canal of claim 33 wherein the composite material
comprises filler reinforced composite material.

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37. The device for filling a root canal of claim 25 wherein the filler cone
comprises a thermoplastic or chemoplastic material.

38. The device for filling a root canal of claim 25 wherein the filler cone
comprises a resinous material.

39. The device for filling a root canal of claim 25 wherein the filler cone comprises gutta percha.

40. The device for filling a root canal of claim 25 wherein the filler cone
5 comprises polyacrylate, polyurethane, polypropylene, polyethylene, polyamide, fluoropolymer, polyester, polyphosphazene, polyanhydride, polysulfide, polyether, epoxy, polycarbonate, polystyrene, polybutadiene, polyphenylene oxide, silicone rubber or a mixture thereof.

10 41. The device for filling a root canal of claim 40 wherein the polyacrylate comprises polymethyl methacrylate, polyhydroxy ethyl methacrylate, or hydroxy ethyl methacrylate (HEMA).

15 42. The device for filling a root canal of claim 40 wherein the fluoropolymer comprises Teflon® PTFE or Teflon® PFA.

43. The device for filling a root canal of claim 40 the wherein the polyester comprises polylactic acid, glycolide, polycaprolactone or a co-polymer thereof.

20 44. The device for filling a root canal of claim 40 wherein the silicone rubber comprises polysiloxane.

45. The device for filling a root canal of claim 25 wherein the filler cone
comprises polylactides, polyglycolides, polycaprolactones, polyanhydrides, polyamides,
25 polyurethanes, polyesteramides, polyorthoesters, polydioxanones, polyacetals, polyketals, polycarbonates, polyorthocarbonates, polyphosphazenes, polyhydroxybutyrates, polyhydroxyvalerates, polyalkylene oxalates, polyethylene oxides, polyacrylates/methacrylates, polyalkylene succinates, poly(malic acid) polymers, polymaleic anhydrides, poly(methylvinyl) ethers, poly(amino acids), chitin, chitosan, and copolymers,

terpolymers, or combinations or mixtures thereof.

46. The device for filling a root canal of claim 38 wherein the filler cone further comprises a plasticizing agent, antibiotic agent, cariostatic agent, antibacterial agent, anti-inflamatory agent, biologically active agent, or therapeutic agent, or mixtures thereof.
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47. An endodontic post comprising:
a post section, the post section comprising a rigid endodontic section and a tip section;
10 wherein the tip section is surrounded by a filler cone; and
wherein the tip section comprises one or more protrusions extending outwardly from the tip section for engaging the filler cone.

48. The endodontic post of claim 47 wherein the tip section is integral to the
15 post section.

49. The endodontic post of claim 47 wherein the tip section extends approximately the full length of the filler cone.

20 50. The endodontic post of claim 47 wherein the tip section extends a portion of the length of the filler cone.

51. The endodontic post of claim 47 wherein the one or more protrusions extending outwardly from the tip section comprise a single protrusion disposed annularly at a
25 point around the tip section.

52. The endodontic post of claim 47 wherein the one or more protrusions extending outwardly from the tip section comprise a series of protrusions or depressions disposed at various points along the length of the tip section.

53. The endodontic post of claim 47 wherein the one or more protrusions are selected from the shape consisting of spherical, cylindrical, rectangular, ovoid, and semi-spherical.

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54. The endodontic post of claim 47 wherein the post section is fabricated of metal, plastic, composite, ceramic, glass or polymeric material.

55. The endodontic post of claim 54 wherein the polymeric material is selected
10 from the group consisting of thermoplastic, thermoset, chemoplastic resins and mixtures thereof.

56. The endodontic post of claim 54 wherein the composite material comprises fiber reinforced composite material.

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57. The endodontic post of claim 54 wherein the composite material comprises filler reinforced composite material.

58. The endodontic post of claim 47 wherein the filler cone comprises a
20 thermoplastic or chemoplastic material.

59. The endodontic post of claim 47 wherein the filler cone comprises a resinous material.

25 60. The endodontic post of claim 47 wherein the filler cone comprises gutta percha.

61. The endodontic post of claim 47 wherein the filler cone comprises polyacrylate, polyurethane, polypropylene, polyethylene, polyamide, fluoropolymer,

polyester, polyphosphazene, polyanhydride, polysulfide, polyether, epoxy, polycarbonate, polystyrene, polybutadiene, polyphenylene oxide, silicone rubber or a mixture thereof.

62. The endodontic post of claim 61 wherein the polyacrylate comprises
5 polymethyl methacrylate, polyhydroxy ethyl methacrylate, or hydroxy ethyl methacrylate (HEMA).

63. The endodontic post of claim 61 wherein the fluoropolymer comprises Teflon® PTFE or Teflon® PFA.

10 64. The endodontic post of claim 61 wherein the polyester comprises polylactic acid, glycolide, polycaprolactone or a co-polymer thereof.

15 64. The endodontic post of claim 61 wherein the silicone rubber comprises polysiloxane.

65. The endodontic post of claim 47 wherein the filler cone comprises polylactides, polyglycolides, polycaprolactones, polyanhydrides, polyamides, polyurethanes, polyesteramides, polyorthoesters, polydioxanones, polyacetals, polyketals, polycarbonates,
20 polyorthocarbonates, polyphosphazenes, polyhydroxybutyrates, polyhydroxyvalerates, polyalkylene oxalates, polyethylene oxides, polyacrylates/methacrylates, polyalkylene succinates, poly(malic acid) polymers, polymaleic anhydrides, poly(methylvinyl) ethers, poly(amino acids), chitin, chitosan, and copolymers, terpolymers, or combinations or mixtures thereof.

25 66. The endodontic post of claim 59 wherein the filler cone further comprises a plasticizing agent, antibiotic agent, cariostatic agent, antibacterial agent, anti-inflammatory agent, biologically active agent, or therapeutic agent, or mixtures thereof.

67. A device for filling a root canal comprising:
a carrier; and
a filler cone;
wherein the filler cone is disposed on the carrier;
5 wherein the carrier comprises a rigid handle section and a tip section;
wherein the tip section is surrounded by the filler cone; and
wherein the tip section comprises one or more protrusions extending outwardly
from the tip section for engaging the filler cone.

10 68. The device for filling a root canal of claim 67 wherein the tip section
is integral to the carrier.

69. The device for filling a root canal of claim 67 wherein the tip section extends
approximately the full length of the filler cone.

15 70. The device for filling a root canal of claim 67 wherein the tip section extends
a portion of the length of the filler cone.

71. The device for filling a root canal of claim 67 wherein the one or more
20 protrusions extending outwardly from the tip section comprise a single protrusion extending
annularly at a point around the tip section.

72. The device for filling a root canal of claim 67 wherein the one or more
protrusions extending outwardly from the tip section comprise a series of protrusions
25 disposed at various points along the length of the tip section.

73. The device for filling a root canal of claim 67 wherein the one or more
protrusions are selected from the shape consisting of spherical, cylindrical, rectangular,
ovoid, and semi-spherical.

74. The device for filling a root canal of claim 67 wherein the tip section is narrower in diameter than the handle section.

5 75. The device for filling a root canal of claim 67 wherein the carrier is fabricated of metal, plastic, composite, ceramic, glass or polymeric material.

10 76. The device for filling a root canal of claim 75 wherein the polymeric material is selected from the group consisting of thermoplastic, thermoset, chemoplastic resins and mixtures thereof.

77. The device for filling a root canal of claim 75 wherein the composite material comprises fiber reinforced composite material.

15 78. The device for filling a root canal of claim 75 wherein the composite material comprises filler reinforced composite material.

79. The device for filling a root canal of claim 67 wherein the filler cone comprises a thermoplastic or chemoplastic material.

20 80. The device for filling a root canal of claim 67 wherein the filler cone comprises a resinous material.

81. The device for filling a root canal of claim 67 wherein the filler cone
25 comprises gutta percha.

82. The device for filling a root canal of claim 67 wherein the filler cone comprises polyacrylate, polyurethane, polypropylene, polyethylene, polyamide, fluoropolymer, polyester, polyphosphazene, polyanhydride, polysulfide, polyether, epoxy,

polycarbonate, polystyrene, polybutadiene, polyphenylene oxide, silicone rubber or a mixture thereof.

83. The device for filling a root canal of claim 82 wherein the polyacrylate
5 comprises polymethyl methacrylate, polyhydroxy ethyl methacrylate, or hydroxy ethyl
methacrylate (HEMA).

84. The device for filling a root canal of claim 82 wherein the fluoropolymer
comprises Teflon® PTFE or Teflon® PFA.

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85. The device for filling a root canal of claim 82 the wherein the polyester
comprises polylactic acid, glycolide, polycaprolactone or a co-polymer thereof.

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86. The device for filling a root canal of claim 82 wherein the silicone rubber
comprises polysiloxane.

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87. The device for filling a root canal of claim 67 wherein the filler cone
comprises polylactides, polyglycolides, polycaprolactones, polyanhydrides, polyamides,
polyurethanes, polyesteramides, polyorthoesters, polydioxanones, polyacetals, polyketals,
polycarbonates, polyorthocarbonates, polyphosphazenes, polyhydroxybutyrates,
polyhydroxyvalerates, polyalkylene oxalates, polyethylene oxides,
polyacrylates/methacrylates, polyalkylene succinates, poly(malic acid) polymers, polymaleic
anhydrides, poly(methylvinyl) ethers, poly(amino acids), chitin, chitosan, and copolymers,
terpolymers, or combinations or mixtures thereof.

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88. The device for filling a root canal of claim 80 wherein the filler cone further
comprises a plasticizing agent, antibiotic agent, cariostatic agent, antibacterial agent, anti-
inflammatory agent, biologically active agent, or therapeutic agent, or mixtures thereof.

89. A method for restoring the root canal of a tooth comprising:
preparing the root canal;
providing a post for insertion into the canal, whereby the post comprises a post
section, wherein the post section comprises a rigid endodontic section and a tip section,
5 wherein the tip section is surrounded by a filler cone, and wherein the tip section comprises
one or more protrusions extending outwardly from the tip section for engaging the filler cone;
and
inserting the post into the canal, whereby the root canal is filled by the filler cone.

10 90. The method of claim 89 wherein the filler cone is softened prior to insertion of
the post into the canal.

91. The method of claim 89 further comprising injecting a sealing material into
the canal to bond the post to the canal prior to insertion of the post into the canal.

15 92. The method of claim 89 further comprising building a core on an end of the
post that extends from the canal.

93. The method of claim 92 further comprising placing a crown on the core.
20 94. The method of claim 89 wherein the tip section is a flexible carrier.

95. A method for restoring the root canal of a tooth comprising:
preparing the root canal;
providing a device for filling a root canal whereby the device comprises a carrier and
a filler cone, wherein the filler cone is disposed on the carrier, wherein the carrier comprises a
rigid handle section and a tip section; wherein the tip section is surrounded by the filler cone;
and wherein the tip section comprises one or more protrusions extending outwardly from tip
section for engaging the filler cone; and

inserting the carrier into the canal, whereby the root canal is filled by the filler cone;
and

removing the handle and carrier section from the filler cone.

5 96. The method of claim 95 wherein the filler cone is softened prior to insertion of
the carrier into the canal.

97. The method of claim 95 further comprising inserting a sealing material into
the canal to bond the filler cone to the canal prior to insertion of the carrier into the canal.

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98. The method of claim 95 further comprising filling the tooth with composite
material to complete the process.

99. The method of claim 95 wherein the tip section is a flexible section.

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